

Response to August 4, 2008 EPA BART Comments for Stanton Unit 1

Comments 44-50 apply to the Department's BART Determination

Comment #44:

We believe that the proposed technology (spray dryer/fabric filter) is inferior, and coupled with what we find to be an inflated uncontrolled emission rate, results in SO₂ limits that are too high (0.24 for lignite, 0.16 for PRB coal). A lower emission limit can be achieved by using a more realistic uncontrolled rate and increasing the design removal efficiency. Although this is the smallest of the subject-to-BART units in terms of megawatts, this and other power plants are among the largest emitters in the State. It may be more cost-effective to consider further controls now in order to meet reasonable progress requirements, rather than waiting to address these requirements with other sources during the development of the remainder of your Regional Haze SIP.

Response to Comment #44:

The Department agrees that higher SO₂ control efficiencies can be attained. Control technologies with higher SO₂ removal efficiencies (a wet scrubber and a circulating dry scrubber) were included in the BART analyses for both lignite and PRB coal combustion. As indicated in the BART determination, these technologies were eliminated from consideration as BART due to economic and environmental considerations.

The Department's economic analyses were based on uncontrolled annual SO₂ emissions of 1.81 lb/million Btu for lignite and 1.2 lb/million Btu for PRB coal. The proposed BART emission limits for SO₂ are based on a 30-day rolling average (as opposed to an annual average) with 90% reduction and also includes emissions from startups, shutdowns and malfunctions. Based upon historical SO₂ emissions data for spray dryers and fabric filters at facilities burning North Dakota lignite, we have determined that an increase of 33% is warranted to adjust from an annual average SO₂ emission rate to a 30-day rolling average emission rate. The discussion regarding potential SO₂ emission rates as high as 2.4 lb/million Btu for lignite and 1.6 lb/million Btu for PRB coal was intended to show that higher sulfur coal could be encountered (see Appendix E, Sulfur Content Statistical Analysis, of the GRE BART Analysis).

The EPA also states, "it may be more cost-effective to consider further controls now in order to meet reasonable progress requirements...". This statement appears to be based almost entirely on speculation as EPA provides no basis for the comment. In addition, the Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program states, "Note that for some sources determined to be subject to BART, the State will already have completed a BART analysis. Since the BART analysis is based, in part, on an assessment of many of the same factors that must be addressed in establishing the RPG, it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG-related requirements for source review in the first RPG planning period. Hence, you may conclude that no additional emissions controls are necessary for these sources in the first planning period".

Comment # 45(A):

On p. 8, NDDH uses an uncontrolled emission rate of 2.4 lbs/MM Btu for calculation of BART limits. This number appears to be inflated since a value of 1.81 lbs/MM Btu is used on p.4 and the highest year's value from CAMD (prior to the fuel switch) was 1.92 lbs/MM Btu.

Response to Comment #45(A):

This comment is addressed in the Department's response to Comment #44 above.

Comment #45(B):

A wet scrubber was eliminated from consideration based on environmental considerations, but it is not clear how significant these other considerations were and why they were not significant at any other plant. Please explain.

Response to Comment #45(B):

The Department eliminated a wet scrubber from consideration as BART at Stanton Unit 1 based upon a combination of factors. These include the relatively high incremental cost of \$4,179 per ton of SO₂ removed when burning lignite and \$6,302 per ton of SO₂ removed when burning PRB, the additional environmental impacts of a wet scrubber and the fact that a wet scrubber will remove a relatively small amount of SO₂ when compared to a spray dryer (with a small corresponding visibility improvement).

The additional environmental considerations are further outlined below:

- A wet scrubber is estimated by GRE to use as much as 20% more water or approximately 15 million gallons per year of additional water.
- It is assumed that a wet scrubber system will require additional on-site ponding. GRE has identified two potential areas on site that could be used for the additional ponding. The areas include the existing ash pile, which would have to be excavated and moved, or the abandoned ash disposal area adjacent to the river, which reportedly has geotechnical deficiencies.
- Dry scrubbers are purported to achieve a higher mercury control efficiency on lignite and PRB as compared to a wet scrubber. In addition, future mercury control requirements could result in high concentrations of mercury in the ponds and prove problematic to discharge.

Comment #46:

On p. 22, a possible future sulfur content of 1.6 lb/MM Btu is used to calculate the BART limit. We find this assumption unrealistic given that recent content at Stanton, since the switch to PRB

coal, is closer to 0.5 lb/MM Btu. Please clarify if you disagree or provide a more realistic assumption for future sulfur content.

Response to Comment #46:

The sulfur content of coal varies considerably. The sulfur content of the PRB coal recently combusted at GRE Stanton has no bearing on the sulfur content of coal which might be burned at the facility in the future. Based on the data contained in Appendix E, Sulfur Content Statistical Analysis, of the GRE BART Analysis, the Department considers a future sulfur content of 1.6 lb/MM Btu to be realistic.

Comment #47:

The SO₂ analyses do not address the scenario for when a combination of PRB coal and lignite are burned, although this scenario is included in the proposed permit to construct for BART. If NDDH intends to keep this option in the permit, then the BART determination must include the necessary analyses.

Response to Comment #47:

The BART analyses were conducted assuming 100% lignite combustion and 100% PRB coal combustion. Since the same control technologies were chosen for both scenarios, any BART analysis conducted assuming a blending of lignite and PRB coal would result in the choice of the same control technologies as BART. The Department has included language in the BART determination addressing the limits when combusting lignite and PRB coal in combination. It should be noted that GRE has indicated that lignite and PRB coal will likely only be burned in the same 30-day averaging period during a switch from one coal to another (i.e., fuel blending is not likely to occur on an extended basis).

Comment #48(A):

On pp. 13 and 24, the amount of emission reductions that can be achieved is underestimated in these tables. Greater control efficiencies are generally achieved by combining combustion controls plus SNCR.

Response to Comment #48(A):

The EPA states that the amount of NO_x emission reductions that can be achieved are generally underestimated in the BART determination; however, the EPA provides no information supporting this statement. The Department has determined that the control efficiencies assumed are reasonable and the EPA provided no information to the contrary.

Comment #48(B):

The State's proposal of LNB+OFA+SNCR is commendable since it goes beyond what can be achieved with just combustion controls. However, the BART limit should be tightened since

current (pre-BART) emissions using PRB coal at Stanton are already very close to the proposed limit (0.26 lb/MM Btu vs. 0.23 lb/MM Btu).

Response to Comment #48(B):

EPA states that “current (pre-BART) emissions using PRB coal at Stanton are already very close to the proposed limit (0.26 lb/MMBtu vs. 0.23 lb/MMBtu)”. As with the SO₂ emission rates, the EPA fails to distinguish between annual emissions and 30-day rolling average emissions. Also, the most recent annual average annual NO_x emission rates from Stanton Unit 1 for 2006 and 2007 are 0.28 lb/MM Btu, not 0.26 lb/MM Btu.

There exist operational considerations at Stanton Unit 1 which are likely to affect the NO_x emission rate on a short-term basis. These operational considerations are summarized below:

- Under normal operating conditions, Unit 10 is run at full utilization while Unit 1 varies (swings) to meet Midwest Independent System Operators (MISO) power demands. These load swings can impact NO_x emissions on a short-term basis.
- If Unit 10 trips due to a tube leak or other maintenance problem, Unit 1 needs to operate all three mills in order to fully supply steam to the single turbine. Under the three mill operational scenario, NO_x emission rates are higher than under the two mill scenario. It is possible for Unit 1 to operate on all three mills for as much as 30 days.
- Nitrogen can vary by coal type, which will impact NO_x emissions.

Comment #49:

We note that the proposed spray dryer/fabric filter would reduce PM emissions as well, but the BART determination does not seem to account for it in the proposed PM limit.

Response to Comment #49:

As indicated in the BART determination, BART for filterable PM for both lignite and PRB coal is proposed as no additional control due to the prohibitive cost of additional PM controls and the insignificant visibility improvement expected from additional PM controls. The fact that a spray dryer / fabric filter is being installed to control SO₂ emissions is a separate issue and does not affect the BART determination for PM.

Comment #50:

Summary table, p. 27: (A) The SO₂ limit provided for PRB coal is not listed in the table of the SIP text, p. 33. (B) Neither this summary table nor the SIP text, p. 33, includes the SO₂ and NO_x limits when a combination of lignite and PRB coal are burned, even though the proposed permit does include these “combination” limits. Please clarify/resolve these inconsistencies.

Response to Comment #50:

The SIP has been corrected to account for the different proposed limits.

Comments 51-54 Apply to the Proposed Permit to Construct for Stanton Unit 1

Comment #51:

II.A.1.c. and II.A.1.f: These calculations for determining the SO₂ and NO_x limits when a combination of lignite and PRB coal is burned do not seem consistent with the language in the SIP text, pp. 24 and 26, which states that the limits are the same whether burning PRB coal alone or in combination with lignite. Please clarify/resolve this inconsistency.

Response to Comment #51:

The language in the SIP has been corrected.

Comment #52:

II.A.1.g.: There appears to be a typo in the last sentence. The reference should be to II.A.4.b.(5), not III.A.4.b.5.

Response to Comment #52:

The change has been made to the permit.

Comment #53:

II.A.4.b.(5): The phrase “EPA-approved” was deleted from the last sentence regarding other test methods and should be corrected.

Response to Comment #53:

The requested change has been made.

Comment #54:

II.A.4.b.(7): A cross-reference to II.A.1.c. should be included. Based on conversations between our staffs, we understand that you have agreed to make this change.

Response to Comment #54:

The requested change has been made.